Interdisciplinary Instrumentation Colloquium

Time Projection Chamber R&D

Speaker: Michael T. Ronan
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Date: Wednesday, May 3, 2006
Time: 4:00 PM sharp
Place: LBNL, Building 50 Auditorium
(directions at http://InstrumentationColloquium.LBL.gov)

The Time Projection Chamber (TPC) was invented at LBNL about 30 years ago. It consists of a large gaseous volume where charged particles form curved ionization tracks in a magnetic field. The ionization electrons drift in parallel electric and magnetic fields to endplane readout detectors. TPCs have been key components in several e+e- collider experiments, in the STAR heavy ion experiment at RHIC, and in many other applications such as double beta decay and dark matter searches. Multiwire Proportional Chamber (MWPC) readout technology has been used in all applications to date to obtain 100-200 micron resolutions, despite introducing E x B distortions and signal spreading. In the last few years new Micropattern Gas Detector techniques have been developed to amplify electron signals in micron scale structures at high fields. These devices offer the possibility of improved TPC readout without distortions or signal spreading. This talk reviews recent progress in GEM and Micromegas TPC R&D and discusses applications at the future International Linear Collider (ILC).

Presentations (pdf files) and dates of future colloquia are posted at
http://InstrumentationColloquium.LBL.gov

Suggestions for speakers and topics are welcome. Please contact
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